IMPERIAL MYCOLOGICAL INSTITUTE
12 JUL 1945

1945

UNIVERSITY OF MAINE

The Maine Agricultural Experiment Station

ORONO

BULLETIN 434 APRIL, 1945

TREATMENT OF POTATO REFUSE PILES TO PREVENT SPREAD OF LATE BLIGHT

G. P. Steinbauer.

UNIVERSITY OF MAINE
THE MAINE AGRICULTURAL EXPERIMENT STATION
ORONO, MAINE

The Extension Service (2) is conducting a campaign to eliminate the potato cull pile as a blight menace. However, the responsibility for the actual treatment of these discarded potatoes rests with the growers, dealers, and warehouse owners, especially on their respective properties. In many communities there are common waste heaps and the question arises as to who shall undertake control of such material. It would seem that communities that derive their income from potato growing could well afford to appoint someone to be charged with this responsibility. Costs of eliminating these infected vines are small when the growers and dealers cooperate.

How Early Should Refuse Heaps Be Treated

According to Bonde and Schultz (1) the earliest record of blight infection on refuse heaps in Northeastern Maine during any year was on June 8. Potato dumps should be treated preferably by June 1, certainly not later than June 15, and then at bi-weekly intervals as long as green sprouts remain. Many of the methods recommended in this bulletin will completely kill the sprouts and tubers with a single treatment. However, many of the refuse heaps are added to during late spring and early summer, as the potato warehouses and cellars are being emptied and cleaned for storage of the new crop, so that the treatment may need to be repeated.

Methods of Treating Potato Refuse Heaps Vary

There is no one method of treating refuse heaps that is superior to all others. The important thing to remember is that the dump piles should be treated *early* enough, *treated effectively,* and checked for *recurrence* of *sprouts.* Tubers that have been discarded during the winter period need give no further concern, provided they have been scattered in thin layers outdoors during freezing weather.

As far as the small dump heaps on farms are concerned, the old saying, "Out of sight, out of mind," applies all too well. In many instances the discarded tubers are carted off to some thicket and forgotten. Bonde and Schultz (1) point out that "experience has shown that the average grower frequently fails to destroy the

TABLE 1

Herbicides useful in treating potato refuse heaps to prevent spread of late blight.

Herbicide	Preparation and concentration	Remarks and precautions
Sinox	2 gallons of concentrate, to 90 gals. of water, then add 10 lbs. of sulfate of ammonia (previously dissolved in several gals. of water), make up to total of 100 gals. of spray solution.	Relatively non-poisonous to humans but vapors should not be breathed, or liquid taken internally. Stains woolens and other animal material.
Dowspray "66"	12 lbs. to 90 gals. of water, then add 1 lb. of sulfate of ammonia (previously dissolved in several gals. of water), make up to total of 100 gals.	Fumes are very irritating to nose and skin.
Sodium arsenite	12 lbs. to 100 gals. of water, or about 24 lbs. of "Handy Killer" to 100 gals. of water.	Arsenites are violent poisons, do not breathe vapors. Use only where there is no danger of livestock poisoning.
Ammonium sulfamate	1 lb. to 1 gal. of water.	
Ammonium thiocyanate	1 lb. to 1 gal. of water.	Quite corrosive to most metals other than brass or aluminum.
Chlorates	1 lb. of sodium chlorate or 1½ lb. of Atlacide to 1 gallon of water.	Chlorates present a fire hazard unless carefully used. Write for detailed information and precautions before using these materials.
Spent crank case oil, creosote oil, diesel oil, Meo-181.	Use full strength, diluting heavier materials with kerosene to get a consistency suitable for spraying.	
Copper sulfate (blue vitriol or bluestone)	50 lbs. to 100 gals. of water.	Effective if sprouts are young but not as reliable as other treatments.

tops before infection has spread to adjoining potato fields. In view of the difficulty of destroying potato tops on dump piles, it would be much better not to deposit waste potatoes at all." Steinbauer (3) has shown that out of a variety of inexpensive chemical dips available, the most effective one for killing tubers before discarding them is a saturated solution of sodium chloride or common salt. Potato refuse, even when including whole tubers, immersed in a vat of salt brine for 12 hours yielded no sprouts when planted. The refuse can be skimmed off and the brine used repeatedly. Small lots of cull tubers may also be satisfactorily disposed of by *deep burial,* or by piling such refuse in thin layers on top of combustible material and *burning* the material so as to cook the refuse.

If the cull potatoes have not been treated by any of the three methods just described, it will be necessary to treat the potatoes after they have sprouted, using herbicides. So far as is known, herbicides will be wasted if used before the tubers have sprouted. The practice of cutting the tops of sprouted plants in refuse heaps should not be planned on, since the uncut basal parts of the shoots may contain blighted material and the tubers will usually sprout again.

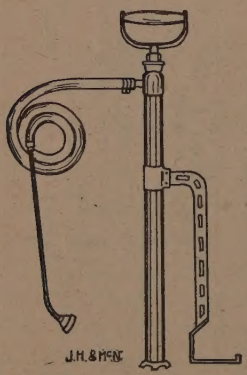

FIG. 1. Bucket pump, operated by placing cylinder in pail, holding it in place by foot piece on outside of pail, and operating plunger by hand.

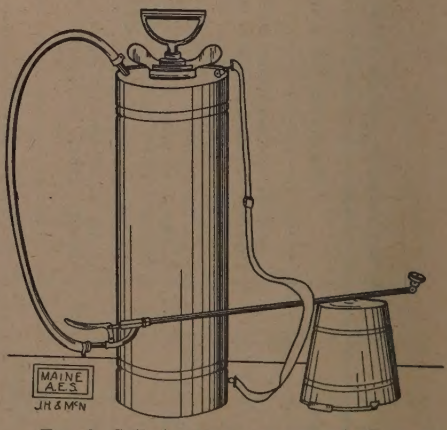

FIG. 2. Cylinder type, compressed air sprayer, hand operated and well suited to spraying small potato refuse piles.

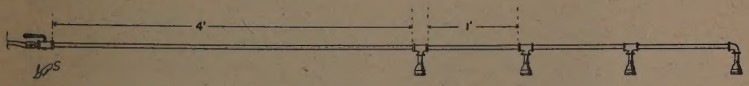

FIG. 3. Boom to be operated from a power sprayer, useful in treating large potato cull piles. In use one man operates the boom, controlling the spray by means of the cut-off valve. The boom is connected to the power sprayer by fifty or more feet of orchard sprayer hose. This boom has other uses on the farm such as applying herbicides along fences and headlands, and eradicating aphid host plants such as wild plum and buckthorn.

After tubers in refuse heaps have sprouted, several different herbicides can be used to kill the sprouts, and these herbicides usually kill the eyes also so that no further sprouting occurs. However, when the refuse is in large heaps, more than one application may be needed to kill the buried sprouts and tubers. The herbicides listed in Table 1, sprayed or sprinkled on the potato refuse, have been found effective in killing the sprouts and tubers.

Herbicides may be applied on small cull piles with a sprinkling can, or with sprayers such as the bucket pump and cylinder type compressed air sprayers illustrated in Figs. 1 and 2. Large refuse heaps along railroad sidings and potato warehouses are best treated with a power sprayer and the spray boom illustrated in Fig. 3. The nozzles on the boom are those used on the ordinary farm potato sprayers, and the pipe is ½ inch stock. The boom is connected to the power sprayer by orchard spray hose, 50 feet or more in length. With this equipment, potato growers in the vicinity of Presque Isle, Maine, have been able to effectively treat hundreds of barrels of potato refuse in a short time. The Dowspray "66" and Sinox sprays are very useful for this purpose. Foliage and tubers should be thoroughly covered and drenched with herbicides to insure rapid killing action. Spray equipment should be thoroughly rinsed out after using any of the above herbicides.

For sources of chemicals consult your county agent.

IMMEDIATE EFFECTS OF POTATO REFUSE TREATMENT NOT ALWAYS EVIDENT

Because of the capacity of the blight organism to produce enormous numbers of spores, which may be carried long distances by the wind, it should not be expected that treatment of the ma-

jority of refuse heaps will completely eliminate late blight. Under favorable weather conditions blight epidemics may develop from a few isolated infected plants. However, a determined community effort to wipe out the potato dump menace should delay the appearance of blight and materially cut down the losses from this disease. For effective blight control, this program must be combined with an effective spray program and the use of approved practices in harvesting and storing potatoes.

LITERATURE CITED

(1) Bonde, Reiner, and E. S. Schultz
Potato Refuse Piles as a Factor in the Dissemination of Late Blight. Maine Agr. Exp. Sta. Bul. 416, 1943.

(2) Annual Report, Maine Extension Service, 1943-44.
Maine Ext. Bul. 325, 1944. See p. 26-27.

(3) Steinbauer, G. P.
Treating Potato Refuse Piles in Control of Late Blight. Me. Agr. Exp. Sta. Bul. 426, 1944. See pp. 234-235.